Author Index

Adriaensen, K. (see Colpaert, J. V.), 367
Alexander, I. J. (see Newbery, D. M.), 401
Allen, M. F. (see Treseder, K. K.), 189
Armstrong, W. (see Rijnders, J. G. H. M.), 497
Arnone III,, J. A., Zaller, J. G., Spehn, E. M., Niklaus, P. A., Wells, C. E. & Körner, C., Dynamics of root systems in native grasslands: effects of elevated atmospheric CO_2, 73
Ashmore, M. R. (see Drogoudi, P. D.), 561
Ashton, N. W. (see Krogan, N. T.), 505
Atkin, O. K., Edwards, E. J. & Byrne, B. R., Research review: Response of root respiration to changes in temperature and its relevance to global warming, 141
Ayling, S. M., Smith, S. E. & Smith, F. A., Transmembrane electric potential difference of germ tubes of arbuscular mycorrhizal fungi responds to external stimuli, 631
Azevedo, J. L. (see Pinto, L. S. R. C.), 609
Bartok, K. (see Purvis, O. W.), 591
Bassirirad, H., Research review: Kinetics of nutrient uptake by roots: responses to global change, 155
Baum, S., Schwarze, F. W. M. R. & Fink, S., Persistence of the gelatinous layer within altered tension-wood fibres of beech degraded by *Ustulina deusta*, 347
Bennett, A. (see Pearson, J.), 317
Bergman, B. (see Rai, A. N.), 449
Beveridge, C., The ups and downs of signalling between root and shoot, 413
Black, C. R. (see Black, V. J.), 421
Black, V. J., Black, C. R., Roberts, J. A. & Stewart, C. A., Tansley Review No. 115. Impact of ozone on the reproductive development of plants, 421
Blom, C. W. P. M. (see Rijnders, J. G. H. M.), 497
Broadley, M. R. (see White, P. J.), 241
——, Escobar-Gutiérrez, A. J., Burns, A., Burns, I. G., What are the effects of nitrogen deficiency on growth components of lettuce?, 519
Brown, S. E. (see Pregitzer, K. S.), 105
Bungener, P. (see Nussbaum, S.), 327
Burns, A. (see Broadley, M. R.), 519
Burns, I. G. (see Broadley, M. R.), 519
Burton, A. J. (see Pregitzer, K. S.), 105
Byrne, B. R. (see Atkin, O. K.), 141
Campa, C., Diouf, D., Ndoye, I. & Dreyfus, B., Differences in nitrogen metabolism of *Faidherbia albida* and other N_2-fixing tropical woody acacias reflect habitat water availability, 571
Chappelka, A. H., Air pollution: forest health and passive sampling, 417
Colpaert, J. V., Vandenkoornhuyse, P., Adriaensen, K. & Vangronsveld, J., Genetic variation and heavy metal tolerance in the ectomycorrhizal basidiomycete *Suillus luteus*, 367
Comas, L. H., Eissenstat, D. M. & Lakso, A. N., Assessing root death and root system dynamics in a study of grape canopy pruning, 171
Crawford, R. M. M., Tansley Review No. 114. Ecological hazards of oceanic environments, 257
Darwent, M. J. (see Rijnders, J. G. H. M.), 497
Deri Tomos, A. (see Korolev, A. V.), 299
Diouf, D. (see Campa, C.), 571
Dreyfus, B. (see Campa, C.), 571
Drogoudi, P. D. & Ashmore, M. R., Does elevated ozone have differing effects in flowering and deblossomed strawberry?, 561
Edwards, E. J. (see Atkin, O. K.), 141
Eissenstat, D. M., Wells, C. E., Yanai, R. D. & Whitbeck, J. L., Research review: Building roots in a changing environment: implications for root longevity, 33
——, (see Comas, L. H.), 171
Escobar-Gutiérrez, A. J. (see Broadley, M. R.), 519
Evans, A. M., Gallon, J. R., Jones, A., Staal, M., Stal, L. J., Villbrandt, M. & Walton, T. J., Nitrogen fixation by Baltic cyanobacteria is adapted to the prevailing photon flux density, 285
Farrar, J. F. & Jones, D. L., Research review: The control of carbon acquisition by roots, 43
——, (see Korolev, A. V.), 299
Fink, S. (see Baum, S.), 347
Fitter, A. (see Norby, R.), 1
Fitter, A. H., Heinemeyer, A. & Staddon, P. L., Research review: The impact of elevated CO_2 and global climate change on arbuscular mycorrhizas: a mycocentric approach, 179
Fuhrer, J. (see Nussbaum, S.), 327
Gallon, J. R. (see Evans, A. M.), 285
Geissmann, M. (see Nussbaum, S.), 327
Geßler, A., Rienks, M. & Rennenberg, H., NH_3 and NO_2 fluxes between beech trees and the atmosphere – correlation with climatic and physiological parameters, 539
Gill, R. A. & Jackson, R. B., Global patterns of root turnover for terrestrial ecosystems, 13
Gill, W. M., Guerin-Laguette, A., Lapeyrie, F. & Suzuki, K., Matsutake -25 morphological evidence of ectomycorrhiza formation between *Tricholoma matsutake* and host roots in a pure *Pinus densiflora* forest stand, 381
Guerin-Laguette, A. (see Gill, W. M.), 381
Gunnarsson, U. & Rydin, H., Nitrogen fertilization reduces *Sphagnum* production in bog communities, 527
Guo, L. D., Hyde, K. D. & Liew, E. C. Y., Identification of endophytic fungi from *Livistona chinensis* based on morphology and rDNA sequences, 617
Hannah, M. A., Iqbal, M. J. & Sanders, F. E., The DL gene system in common bean: a possible mechanism for control of root–shoot partitioning, 487
Hanson, P. J. (see Joslin, J. D.), 117
Heinemeyer, A. (see Fitter, A. H.), 179
Hilgers, U. (see Schmitz, H.), 307
Holmes, W. E. (see Zak, D. R.), 201
Holopainen, T. (see Tarhanen, S.), 579
Houle, G. (see Imbert, E.), 601
Hyde, K. D. (see Guo, L. D.), 617
Imbert, E. & Houle, G., Ecophysiological differences among *Leymus mollis* populations across a subarctic dune system caused by environmental, not genetic, factors, 601
Ingrouille, M. J. (see Pearson, J.), 317
Iqbal, M. J. (see Hannah, M. A.), 487
Jackson, R. (see Norby, R.), 1
Jackson, R. B. (see Norby, R. J.), 3
——, (see Gill, R. A.), 13
Jakobsen, I. (see Smith, F. A.), 357
Johnson, M. G. (see Tingey, D. T.), 87
Jones, A. (see Evans, A. M.), 285
Jones, D. L. (see Farrar, J. F.), 43
Joslin, J. D., Wolfe, M. H. & Hanson, P. J., Effects of altered water regimes on forest root systems, 117
King, J. S. (see Pregitzer, K. S.), 105
——, (see Zak, D. R.), 201
Koide, R. T., Functional complementarity in the arbuscular mycorrhizal symbiosis, 233
Körner, C. (see Arnone III,, J. A.), 73
Korolev, A. V., Deri Tomos, A. & Farrar, J. F., The transtissue pathway and chemical fate of ^{14}C photoassimilate in carrot taproot, 299
Krogan, N. T. & Ashton, N. W., Ancestry of plant MADS-box genes revealed by bryophyte (*Physcomitrella patens*) homologues, 505
Labate, C. A. (see Pinto, L. S. R. C.), 609
Lakso, A. N. (see Comas, L. H.), 171
Lapeyrie, F. (see Gill, W. M.), 381
Leidi, E. O. & Rodríguez-Navarro, D. N., Nitrogen and phosphorus availability limit N_2 fixation in bean, 337
Liew, E. C. Y. (see Guo, L. D.), 617

Massicotte, H. B., Melville, L. H., Peterson, R. L. & Molina, R., Comparative anatomy of ectomycorrhizas synthesized on Douglas fir by *Rhizopogon* spp. and the hypogeous relative *Truncocolumella citrina*, 389

Melville, L. H. (see Massicotte, H. B.), 389

Molina, R. (see Massicotte, H. B.), 389

Nadelhoffer, K. J., Research review: The potential effects of nitrogen deposition on fine-root production in forest ecosystems, 131

Ndoye, I. (see Campa, C.), 571

Newbery, D. M., Alexander, I. J. & Rother, J. A., Does proximity to conspecific adults influence the establishment of ectomycorrhizal trees in rain forest?, 401

Niklaus, P. A. (see Arnone III,, J. A.), 73

Norby, R., Fitter, A. & Jackson, R., Editorial, 1

Norby, R. J. & Jackson, R. B., Research review: Root dynamics and global change: seeking an ecosystem perspective, 3

Nussbaum, S., Bungener, P., Geissmann, M. & Fuhrer, J., Plant–plant interactions and soil moisture might be important in determining ozone impacts on grasslands, 327

Oksanen, J. (see Tarhanen, S.), 579

Osborne, C. P. (see Woodward, F. I.), 223

Pearson, J., Wells, D. M., Seller, K. J., Bennett, A., Soares, A., Woodall, J. & Ingrouille, M. J., Traffic exposure increases natural ^{15}N and heavy metal concentrations in mosses, 317

Pereira, J. O. (see Pinto, L. S. R. C.), 609

Peterson, R. L. (see Massicotte, H. B.), 389

Phillips, D. L. (see Tingey, D. T.), 87

Pinto, L. S. R. C., Azevedo, J. L., Pereira, J. O., Vieira, M. L. C. & Labate, C. A., Symptomless infection of banana and maize by endophytic fungi impairs photosynthetic efficiency, 609

Poikolainen, J. (see Tarhanen, S.), 579

Pregitzer, K. S., King, J. S., Burton, A. J. & Brown, S. E., Research review: Responses of tree fine roots to temperature, 105

——, (see Zak, D. R.), 201

Pritchard, S. G. & Rogers, H. H., Research review: Spatial and temporal deployment of crop roots in CO_2-enriched environments, 55

Purvis, O. W., Williamson, B. J., Bartok, K. & Zoltani, N., Bioaccumulation of lead by the lichen *Acarospora smaragdula* from smelter emissions, 591

Rai, A. N., Söderbäck, E. & Bergman, B., Tansley Review No. 116. Cyanobacterium–plant symbioses, 449

Rennenberg, H. (see Geßler, A.), 539

Rienks, M. (see Geßler, A.), 539

Rijnders, J. G. H. M., Armstrong, W., Darwent, M. J., Blom, C. W. P. M. & Voesenek, L. A. C.S25 J., The role of oxygen in submergence-induced petiole elongation in *Rumex palustris*: *in situ* measurements of oxygen in petioles of intact plants using micro-electrodes, 497

Roberts, J. A. (see Black, V. J.), 421

Rodríguez-Navarro, D. N. (see Leidi, E. O.), 337

Rogers, H. H. (see Pritchard, S. G.), 55

Rother, J. A. (see Newbery, D. M.), 401

Rydin, H. (see Gunnarsson, U.), 527

Sanders, F. E. (see Hannah, M. A.), 487

Schmitz, H., Hilgers, U. & Weidner, M., Assimilation and metabolism of formaldehyde by leaves appear unlikely to be of value for indoor air purification, 307

Schwarze, F. W. M. R. (see Baum, S.), 347

Seller, K. J. (see Pearson, J.), 317

Smith, F. A., Jakobsen, I. & Smith, S. E., Spatial differences in acquisition of soil phosphate between two arbuscular mycorrhizal fungi in symbiosis with *Medicago truncatula*, 357

——, (see Ayling, S. M.), 631

Smith, S. E. (see Smith, F. A.), 357

——, (see Ayling, S. M.), 631

Soares, A. (see Pearson, J.), 317

Söderbäck, E. (see Rai, A. N.), 449

Spehn, E. M. (see Arnone III,, J. A.), 73

Staal, M. (see Evans, A. M.), 285

Staddon, P. L. (see Fitter, A. H.), 179

Stal, L. J. (see Evans, A. M.), 285

Stewart, C. A. (see Black, V. J.), 421

Suzuki, K. (see Gill, W. M.), 381

Tarhanen, S., Poikolainen, J., Holopainen, T. & Oksanen, J., Severe photobiont injuries of lichens are strongly associated with air pollution, 579

Taylor, D. L., A new dawn – the ecological genetics of mycorrhizal fungi, 236

Tingey, D. T., Phillips, D. L. & Johnson, M. G., Research review: Elevated CO_2 and conifer roots: effects on growth, life span and turnover, 87

Treseder, K. K. & Allen, M. F., Research review: Mycorrhizal fungi have a potential role in soil carbon storage under elevated CO_2 and nitrogen deposition, 189

Vandenkoornhuyse, P. (see Colpaert, J. V.), 367

Vangronsveld, J. (see Colpaert, J. V.), 367

Vieira, M. L. C. (see Pinto, L. S. R. C.), 609

Villbrandt, M. (see Evans, A. M.), 285

Voesenek, L. A. C. J. (see Rijnders, J. G. H. M.), 497

Walton, T. J. (see Evans, A. M.), 285

Weidner, M. (see Schmitz, H.), 307

Wells, C. E. (see Eissenstat, D. M.), 33

——, (see Arnone III,, J. A.), 73

Wells, D. M. (see Pearson, J.), 317

Whitbeck, J. L. (see Eissenstat, D. M.), 33

White, P. J. & Broadley, M. R., Tansley Review No. 113. Mechanisms of caesium uptake by plants, 241

Williamson, B. J. (see Purvis, O. W.), 591

Wolfe, M. H. (see Joslin, J. D.), 117

Woodall, J. (see Pearson, J.), 317

Woodward, F. I. & Osborne, C. P., Research review: The representation of root processes in models addressing the responses of vegetation to global change, 223

Yanai, R. D. (see Eissenstat, D. M.), 33

Zak, D. R., Pregitzer, K. S., King, J. S. & Holmes, W. E., Research review: Elevated atmospheric CO_2 fine roots and the response of soil microorganisms: a review and hypothesis, 201

Zaller, J. G. (see Arnone III,, J. A.), 73

Zoltani, N. (see Purvis, O. W.), 591

Subject Index

Acacia, 571
Acclimation, 141
Age-related root respiration, 171
Air pollution, 527, 579
Airborne particulates, 591
Algal ultrastructure, 579
Allocation, 223
Amides, 571
Amino acids, 337
Anatomy, 389
Aphanizomenon, 285
Arbuscular mycorrhizal (AM) fungi, 631
Arbuscular mycorrhizal fungi, 189
Arbuscular mycorrhizas, 357
Artificial symbioses, 449
Assimilate transport, 299
Atmospheric CO_2, 105
Atmospheric nitrogen deposition, 155
Autoradiography, 299
Azolla, 449
Baltic cyanobacteria, 285
Banana, 609
Belowground cycling, 13
Belowground production, 131
Binary mixtures, 327
Bioaccumulation, 591
Bog, 257
Brassica campestris, 421
Brassica napus, 421
Bryophyta, 505
Bryoria fremontii, 579
Bryoria fuscescens, 579
Cadmium, 367
Caesalpiniaceae, 401
Caesium (Cs), 241
Cambium, 299
Carbon, 105
Carbon allocation, 55, 117
Carbon transfer, 401
Cation channel, 241
Climate change, 33, 257
Climatic change, 3
CO_2, 73, 87
Coastal dune, 601
Colletotrichum musae, 609
Commentary, 233, 236
Common bean, 487
Compensation point, 539
Competition, 527
Conifer, 87
Copper, 367
Cuticular deposition, 539
Cyanobacterial–plant symbioses, 449
Daucus carota (carrot), 299
Decay, 347
Diurnal variation, 141
Diversity, 179
DL (Dosage dependent Lethal) alleles, 487
DNA identification, 617
Drought, 117
Dry deposition, 539
Ecophysiology, 601
Ectomycorrhiza, 381
Ectomycorrhizal fungi, 189, 367
Ectomycorrhizas, 401
Editorial, 1
Electric potential difference (p.d.), 631
Elevated atmospheric CO_2, 201
Elevated CO_2, 3, 33
Elevated , 55
Elevated CO_2, 155
Elevated , 179
Elevated CO_2, 189
Enrichment, 73
Environmental plasticity, 601
Epiphytic lichens, 579
Epipremnum aureum, 307
Ethylene, 497
Eutrophication, 527
External hyphae, 189, 631
Faidherbia albida, 571
False heartwood, 347
Fertilization, 527
FESEM, 591
Ficus benjamina, 307
Fine roots, 3, 131
Fine-root biochemistry, 201
Fine-root longevity, 201
Fine-root turnover (FRT), 117
Foliar uptake, 317
Forest ecosystems, 131
Formaldehyde metabolism, 307
Forum Commentary, 413
Forum Meetings, 417
Fragaria × *ananassa* (strawberry), 561
Functional equilibrium, 43
Fungal endophytes, 609
Fungal morphospecies, 617
Fusarium moniliforme, 609
Germ tube, 631
Gigaspora margarita, 631
Global change, 3, 13, 73, 155
Global climate, 117
Global warming, 141
Glutamine synthetase, 571
Grafting, 487
Grape root decomposition, 171
Grassland species, 327
Growth, 527, 561
Gunnera, 449
Heavy metals, 579
Hyphal distribution, 357
Hyphal networks, 401
Hypoxia, 497
Interactions, 449
Interspecific variation, 189
ISSR fingerprints, 367
ITS, 617
Lactuca sativa (lettuce), 519
Land use, 257
Lead, 317
Lead pollution, 591
Leymus mollis, 601
Lichen, 591
Lichens, 449
Life span, 87
MADS-box genes, 505
Maize, 609
Medicago truncatula, 357
Metabolic control analysis, 43
Metal tolerance, 367
Microbial activity, 201
Microbial communities, 189
Microbial N transformations, 201
Micro-electrodes, 497
Minirhizotron, 87, 171
Missing carbon, 73
Mitochondria, 141
Mycorrhizal function, 179
Mycorrhizas, 3
N fixation, 571
N saturation, 131
N_2 fixation, 285, 337
Nitrate reductase, 571

Nitrogen, 317, 527
Nitrogen deposition, 3, 131
Nitrogen deposition or fertilization, 189
Nitrogen (N), 519
Nodularia, 285
North Atlantic oscillation, 257
Nutrients, 105
Oceanic, 257
Open-top chambers, 327
Oxygen, 497
Ozone, 327, 421, 561
P deficiency, 337
Paludification, 257
Petiole elongation, 497
Phaseolous vulgaris, 487
Phaseolus vulgaris, 337
Phloem, 43, 299
Phosphate translocation, 357
Photosynthesis, 519, 561, 609
Physcomitrella (*Aphanoregma*), 505
Phytomediation, 241
Pinus densiflora (Japanese red pine, Akamatsu), 381
Plant competition, 327
Plantago major, 421
Plant–microbe, 449
Plasma membrane, 241
Pollen, 421
Polyphenols, 347
Population structure, 367
Potassium (K), 241
Primary succession, 601
Production, 527
Pseudotsuga menziesii, 389
Q_{10}, 141
Reaction zones, 347
Relative growth rate (RGR), 519
Replacement series, 327
Reproductive development, 421, 561
Resources, 223
Respiration, 105
Rhizopogon, 389
Rhizospheric pH, 337
Romania, 591
Root, 223, 241
Root death, 171
Root demography, 55
Root development, 55
Root dynamics, 3
Root exudation, 43
Root growth, 87, 117
Root herbivory, 33
Root life span, 73
Root morphology, 33
Root mortality, 73, 117
Root nutrient uptake kinetics, 155
Root production, 13, 73
Root respiration, 33, 141
Root senescence, 171
Root survivorship and life span, 171
Root turnover, 13, 33, 55, 73, 87, 131
Roots, 55, 87, 105
Root–shoot partitioning, 487
Rumex palustris, 497
5.8S gene, 617
Sahel, 571
Scanning electron microscopy, 389
Seasonal variation, 141
Seed yield and quality, 421
Sequence analysis, 617
Signalling, 487
Smelter, 591
Soft rot, 347
Soil carbon sequestration, 189
Soil microorganisms, 201
Soil respiration, 201
Soil temperature, 155
Soil water content, 327
Source–sink relations, 43
Species-rich Grassland, 73
Specific root length, 33
Sphagnum, 527
Stable isotope ^{15}N, 317
Stomatal conductance, 519, 539
subarctic Quebec, 601
Submergence, 497
Suillus luteus, 367
Sulphur dioxide, 579
Survival, 257
Symbiotic N_2 fixation, 449
Temperature, 105, 141, 179
Tension-wood fibres, 347
Terrestrial biomes, 13
Tissue density, 33
Transplants, 401
Trebouxia, 579
Tricholoma matsutake (pine mushroom, Matsutake), 381
Triphenyltetrazolium chloride (TTC), 171
Triticum aestivum, 421
Tropical forest regeneration, 401
Truncocolumella, 389
Turnover, 3
Upland oaks, 117
Urban traffic pollution, 317
Ureides, 337, 571
UV microscopy, 347
Vegetation model, 223
Vitis labruscana cv. Concord, 171
Water, 105
Water and nutrient uptake, 223
Winter, 257
X-ray element mapping, 591
Xylem sap composition, 337
Zinc, 317, 367